

## LETTER OF INTENT

### **Principal Investigator**

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### **Co-Investigators**

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**Title of Project**            **Assessment of the Clinical Utility of the Glycemic Index in Diabetes Management**

### **Objectives**

1. To determine current attitudes and practices of dietitians and diabetes educators with respect to the use of the glycemic index in the nutritional management of people with diabetes.
2. To determine the association between glycemic index and post-prandial glycemia in individuals with type1 diabetes undergoing intensive management.

### **Rationale Why Project is Important**

Diabetes has recently been described as the “perfect epidemic” (Lau, 2001) affecting an estimated 104 million people worldwide. By 2010, this figure is expected to increase to 239 million people (Canadian Diabetes Advisory Board, 1997). The main focus in diabetes management is blood glucose control, particularly as it pertains to carbohydrate intake and the glycemic response to carbohydrate-containing foods (Kalergis et al, 1998). One way to describe the glycemic response to various carbohydrate-containing foods is Glycemic Index (GI). This term was first coined by Jenkins to describe the extent that blood glucose rises after a test food in comparison to a reference food, usually white bread (Jenkins et al., 1984). Although this concept has made it easy to predict the glycemic response of predominantly carbohydrate-containing foods, the clinical utility of this measure has been seriously questioned, especially as it pertains to mixed meals. Because of this perceived limitation, dietitians and diabetes educators have been reluctant

to integrate this concept in their clinical practice. Currently, the use of the GI in clinical practice, and in particular the use of low GI diets, is being advocated by a joint Food and Agriculture Organization (FAO) and World Health Organization (WHO) Expert Consultation committee (FAO/WHO, 1997). This report suggests how the GI can be applied to mixed meals or whole diets. The report also suggests using the GI as a way to guide food choices and develop exchange lists. Since this concept is currently being advocated by FAO/WHO as well as by the Nutrition Committee of the Canadian Diabetes Association (1999), it is important to determine if dietitians and diabetes educators are aware of these recommendations and what their current attitudes and practices are regarding this concept. This is the focus of our first objective.

Our second objective pertains to the effect of glycemic index on blood glucose control. In the management of diabetes, blood glucose control is usually assessed by fasting blood glucose, pre-meal glucose and long-term glucose control as determined by glycated hemoglobin or HbA1c every 2-3 months. However, the contribution of post-prandial glycemia to morbidity and mortality is currently being questioned, an area requiring further research (American Diabetes Association, 2001). Therefore, we would like to investigate the association between glycemic index and post-prandial glycemia.

### **Methodology**

Objective #1 will be achieved by administering a survey via email to a random sample of dietitians who are members of Dietitians of Canada, Ordre Professionnel des Diététistes du Québec, Canadian Diabetes Association, and the Quebec Diabetes Association. Permission will be requested from these associations prior to contacting members. The survey will include questions assessing the attitudes, beliefs and current practices of dietitians and diabetes educators regarding the use of the GI in their clinical practice. Attitudes and belief questions regarding perceived clinical utility, benefits, and barriers will be developed based on the Health Belief Model and the Theory of Reasoned Action.

Objective # 2 will be achieved by analyzing data collected from Maria Kalergis's Doctoral study on "prevention of nocturnal hypoglycemia in adults with type 1 diabetes undergoing intensive management," a project that was funded by the Canadian Diabetes Association (Doctoral supervisory committee: Drs. Yale, Schiffrin, Gougeon and Jones). The question we would like to answer in this application is **unique** and is not at all related to the objectives of the Canadian Diabetes Association study (please see Appendix 1). Secondary analyses of this existing data bank will be conducted. This study consists of a sample of 22 subjects who completed 18 days of food records during a 9 month period (3 day food records at 6 time points). Subjects were provided with a Continuous Glucose Monitoring System (CGMS, MiniMed, Inc.). This device resembles an insulin pump and is worn in a similar fashion (ie-subcutaneously). It can be worn for up to 3 consecutive days at a time. Each subject wore it for 18 days, corresponding to the 18 days of food records. The CGMS measures interstitial blood glucose every 5 minutes, providing up to 288 blood glucose readings per day. The food records obtained in this study will be analyzed using the Genesis Nutritional Analysis program and meals will be categorized into high, medium and low GI categories. Measures of post-prandial

glycemia will include: peak post-prandial glucose (PPG), mean post-prandial glucose (MPG) and post-prandial glycaemic excursions (PPGEs), defined as the change in blood glucose concentration from before to after a meal (2 hr PC). The relationship between GI categories and measures of post-prandial glucose will be determined using one-way Analysis of Variance (ANOVA). Details of statistical analyses will be addressed in the main proposal.

### **Proposed Timeline**

12 months:

Part I (survey): months 0 to 6 (data collection and statistical analyses);

Part II (secondary analyses): months 0 to 10 ( food record analysis, calculations of post-prandial glucose, statistical analyses).

Months 10 to 12: preparation of two manuscripts.

### **Significance**

We believe that this study will provide dietitians and other health professionals with very important information regarding clinical utility of the glycaemic index as it will be the first study to our knowledge to assess the relationship between the GI and measures of post-prandial glycemia as determined by the CGMS. It will also provide vital information regarding current attitudes, beliefs and practices of dietitians and diabetes educators with respect to the use of Glycaemic Index in the nutritional management of diabetes.

### **Proposed Budget**

Data collection, entry and analysis	\$10, 500
Statistical Consultant	\$ 3, 000
Supplies and Materials	\$ 1, 500
<b>TOTAL</b>	<b>\$ 15, 000</b>

### **References**

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National Nutrition Committee. "Guidelines for the Nutritional Management of Diabetes Mellitus in the New Millennium: A Position Statement." Canadian Journal of Diabetes Care. 1999, 23 (3): 56-69.

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